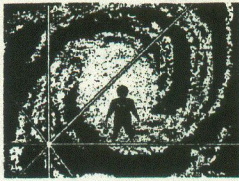


The Dark Sky Observer



A Publication of the North Jersey
Astronomical Group



"What is inconceivable about the universe is that it is at all conceivable" -Albert Einstein

Supernova Gives Birth To Pulsar

by Roger Sudol

Amid the debris from 1987A, astronomers have found a newly formed pulsar, an extremely dense neutron star spinning at a rate of 1,968.429 revolution per second. This event is of particular importance to the scientific community because it gives us so much information about the shaping of the universe and the creation of most of the elements that make up the Earth.

The pulsar was sighted in the Large Magellanic Cloud, approximately 170,000 light years away. The supernova that spawned it was visible for several months although only in the Southern Hemisphere. It has been the subject of an intense scientific examination. The pulsar is so dense that it is estimated that a teaspoon filled with its matter could weigh an amazing 300,000 tons.

Actually a pulsar is a gigantic atomic nucleus because it consists of nothing but neutrons held together by the grip of the enormous weight of the star. Had it not been for its weight the pulsar would be torn apart by the centrifugal force that is caused by its speed of rotation. Nothing on Earth except the nucleus of an atom could hold together at such a speed.

The first pulsars were discovered in 1967 when radio waves from one of these stars was detected by a large radio telescope in England. The regularity of the radio pulses confused scientists into believing they may have been transmitted by an intelligent life form. Later, the idea of a rotating star emitting energy from only one side was realized.

While much has been learned from this event there are still questions to be answered. There is much we can still learn from it.

One curious aspect of this particular pulsar is that it regularly shifts its speed of rotation. Some researchers suggest that it may have ejected a large amount of matter that is now orbiting the star and is affecting it gravitationally. The matter would have to be ejected by the supernova because if it had been there originally, it would have been blown away.

An interesting fact is that even though we are witnessing this event from earth now, Supernova 1987A actually occurred 170,000 years ago. If you think about it, we are actually looking backward through time and we really have no proof as to what is happening there right now.

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LAST MEETING

The last meeting of the N.J.A.G. was called to order at 8:10 p.m. by President Glenn Burke and was attended by 24 members and 1 guest. The minutes from the previous meeting were read by Recording Secretary Julie Conroy and accepted.

Corresponding Secretary Dennis Koenig reported that a letter had been received from Amateur Astronomers Inc. proposing a get together for all of the New Jersey Astronomy Clubs. A newsletter exchange as well as a meeting of club representatives is planned. Glenn Burke and Grace Casalino will be our representatives. Dennis also reported that he has sent away for several astronomy related catalogs. John Miksits will assume the duties of club librarian.

Treasurer Ruth Koenig reported a balance of \$532.88.

Vice President Grace Casalino reported that a book entitled "Universe Guide to Stars and Planets" would be raffled off after the meeting. Chances were \$.25 each.

The astrophotography committee announced that Glenn Burke would be presenting a workshop on "crankers" after the meeting. Upcoming workshops were also detailed for the club.

The computer committee reported that Mike Lynch had obtained a 1200baud modem for the club computer. A club bulletin board is hoped to be set up.

The darkroom committee reported that the slide copier has been back ordered.

The education committee reported that the class was scheduled to begin on Feb 28. All instructors should contact Jim Beirne.

The membership committee reminded members that dues are due for those who joined the club prior to Feb 29, 1988.

The newsletter chairman reported that the new newsletter is "off the ground" and

has been well received. Jim Beirne was thanked for his contribution to the new newsletter.

The observation committee announced that Alice Berman has Qualified on the C-8. The dark sky sights and answering machine were explained to the newer members. Glenn Burke discussed up coming events hosted by the Rockland Astronomy Club. The details for the upcoming "Messier Marathon" on March 11 were discussed.

The program committee reported that a field trip to the Cranford Club is planned for March. Also in the works are a Hayden Planetarium trip in May, Talks by Dr. Hess and others, and the clubs annual picnic.

The project committee reported that work continues on the 12" mirror blank. Jim Beirne reported that the refractor is basically operational. Minor adjustments are all that are needed.

A motion to initiate a sunshine fund was made and carried.

\$102.00 was allocated to pay the club insurance bill.


Ruth Koenig mentioned that anyone interested in club hats should see her.

Glenn Burke announced that the executive committee would hold monthly meeting of officers and committee chairpersons at the Nature Center on the first Wed. of the month. All members are welcome to attend. Among the items to be discussed will be the revision of the present by-laws and constitution.

The meeting was adjourned at 8:45.

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Observation Committee Report

The Observation Committee is planning to compile a compendium of Messier observations made by the members of the N.J.A.G. As many members as possible are hope to participate. The idea is to 

create a list of description that fit what an amateur would see in an amateur telescope, rather than what professional astronomer would see in a professional scope.

Anyone interested in contributing their personal observations should contact Observation Committee Chairpersons; Glenn Burke or Dennis Koenig.

Project Committee Report

The 12" mirror that the club had been grinding until about a year ago has been resumed. The flat edge that developed has been corrected although the subdiameter tool that we've been using will continue to present a hazard of it returning. Therefore an attempt has been made to have a full size ceramic tool molded for it. If the ceramic tool is successful that mirror should be completed sometime this summer. There are no current plans concerning what type of mounting we will put this mirror on. Any ideas, no matter how wild, are welcome and should be directed to either Roger Sudol or Joe Volpe, the project chairpersons.

The 4" refractor telescope that was donated to the club is now entering the final steps of restoration. It has been star tested without columnation and showed promising results.

It has come to the attention of a few club members that the people who attend our public nights have no conception of the astronomical distances. An idea to create a 2.281 billion:1 scale model of the inner solar system is being worked out for our Astronomy Day presentation. The outer planets will also be represented, but only to scale by diameter, not by distance. Even at this scale Neptune would be over a mile away!

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Book Reviews

Sky Catalogue 2000.0 Vol 1: Stars to Magnitude 8.0

A. Kirshfeld & R. Sinnott, eds.

by Doug Kittredge

"Sky Catalog Vol. 8" is a nifty source for the serious amateur, a storehouse of information on 45,269 stars down to magnitude 8, about the same number of stars as plotted in Sky Atlas 2000 (by W. Tirion). Making use of the NASA Goddard SKY MAP project, the volume gives data on the following: Henry Draper Number; Smithsonian Astrophysical Number; star name (if any); right ascension (2000); declination (2000); proper motion in r.a. and dec.; apparent visual magnitude; B V color index; absolute visual magnitude; spectral type; luminosity class and peculiarity code; radial velocity(km/sec); distance and other designations.

I'll admit that this is very esoteric, but who said that astronomy is practical in the first place? Unless you're a professional, it doesn't put bread on the table or increase your social standing. Amateurs study astronomy for the sheer joy of it.

Facts (or estimates) can seem very dry at first glance, but, used in conjunction with observing, they can increase ones understanding and appreciation of the night sky. How often, for example, have I been in awe of Andromeda, steeped in the knowledge that the object is 2 1/2 million light years distant, a fact I learned by reading the printed page.

As Thoreau wrote, "Let us not understand the value of a fact, it will one day flower in a truth". Buy the book only if you are "turned on" by astronomy sufficiently to appreciate it; otherwise it may turn out to be a cold compendium of facts indeed. ☆

More Book Reviews 

"Prism and Lens Making"

Frank Twyman

by Roger Sudol

A part of the "Adam Hilger Series on Optics and Optoelectronics", "Prism and Lens Making" is one of the most informative books about optical grinding I've ever come across. While most books of this sort are generally concerned with grinding one particular optical element, such as a lens or mirror, this one covers every aspect of the art.

The book starts off with a brief history of optical work, starting with the ancient Egyptians, going on to Newton, Herschel, von Fraunhofer and finally to Lord Rosse.

Moving along through the book we find some basic information about grinding and polishing tools, abrasives, pitch recipes among other general bits of information needed to grind most any optics.

Then comes the good stuff. "Dioptric Substances" are discussed heavily. Everything you ever wanted to know about the properties of glass, from the hardness, to the expansion coefficient, to the refractive index, to the colors of different types of glass. Even the use of optical plastics is discussed.

Many different types of optics are covered. Prisms, pentaprisms, spherical surfaces, non-spherical surfaces, microscope optics, telescope optics, concave mirrors, even spectacle and bifocal lenses are discussed.

Methods of testing optics are explained, but mainly using expensive equipment such as: the Hilger-Chance Precision Refractometer, ultra-violet microscopes, and of course, the "Hilger Interferometer" in its numerous versions and configurations.

Overall this book is a great reference, although I would not suggest it as a book to

grind your first mirror by. Mr. Twyman has a habit of getting very technical in his terminology. This book is not written for the beginning amateur telescope maker. Do some grinding using "Amateur Telescope Making" first, then you'll have the ground work to understand this book. ☆

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THE OBSERVER'S LOG

The Gems of Gemini

by Glenn Burke

On a mid March evening at about 9:00, the constellation of Gemini the twins has just crossed the zenith on its slow circle about the north celestial pole. Gemini is located NE of Orion and is easily identified by its two brightest stars, Castor and Pollux, which lie only 4.5 degrees apart. Castor is designated the Alpha star of the constellation, shining at magnitude 1.59. Pollux, the beta star, shines at magnitude 1.16. The fact that Castor is designated the Alpha star is strange because in most constellations the Alpha is the brightest. Robert Burnham suggests that, in the intervening centuries since these two were designated, one has changed its brightness. Castor is resolved into what is ranked as one of the most beautiful double stars. The stars shine at magnitude 2.0 and 2.8. A third star shining at magnitude 9.1 orbits these two stars, making a triple star system. But wait, Each of these three stars turn out to be double stars themselves when viewed in their spectra! A sextuple star system.

Gemini does not contain an over abundance of deep sky objects, but some of the objects it does contain truly are 'gems'. Charles Messier saw fit to leave one of his calling cards in Gemini, the rich cluster M-35. If you have ever seen the clusters M-36, M-37 or M-38 and thought they were good, you're going to love M-35. M-35 shines at magnitude 5.5 and is ☞

located about 2.5 degrees NW of Eta Geminorium. In a 32mm eyepiece in my 14, M-35 filled the field from edge to edge with a swarm of blue stars. The center of the cluster was dominated by a gently curving arc of stars, punctuated at each end with a very bright star. A conservative estimate would say it consists of about 100 visible stars. NGC-2158 appears as a faint nebulous patch on the SW fringe of M35. In the 14 using a 13mm ocular, I was able to notice a slight resolution of the cluster's edge using averted vision. In my log, I noted that the cluster looked like a distant globular. Later on, a check in Burnham's revealed a study done by Astronomer Halton Arp found that, indeed, NGC-2158 may be a cluster somewhere between an open cluster and a globular cluster. NGC-2158 is 16,000 l.y. distant, almost 6 times farther away than M-35! In any case these two objects will provide a spectacular view in any size telescope.

Continuing a little ways to the west of NGC-2158, you will stumble onto the small cluster IC-2157. I noted it as a small cluster of about 10 to 15 stars. Webb's lists an IC-2156 right next to IC-2157, but the two together aren't that great. A little farther to the SW just off the star 1 Geminorium is the cluster NGC-2129. It is a small cluster dominated by two bright stars. Webb's lists it as a cluster of 17 8TH and 9TH magnitude stars as seen in a 10" scope. In the 14, I estimated about 11 stars. Before pulling back from the border of Gemini, there is one more object in this vicinity. J-900 is a faint gray spot in the 14 using a 9mm eyepiece. Although Webb's suggests high power should reveal some structure, I could see none. However, on the night I viewed it, conditions were not optimum.

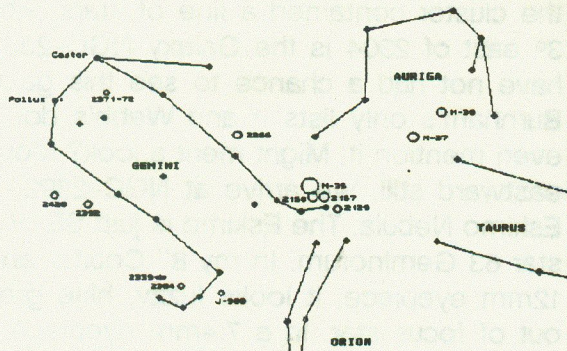
Rounding Gamma in a clockwise fashion, we continued our tour of deep sky objects in Gemini. On the southern side of Gemini the first object to be encoun-

tered is NGC-2304. 2304 is a dim cluster, but very rich. In the 14 using a 9mm, it contained about 20 or 30 stars. One side of the cluster contained a line of stars. About 3° east of 2304 is the Galaxy NGC-2339. I have not had a chance to see this galaxy. Burnham's only lists it and Webb's doesn't even mention it. Might merit a look? Moving eastward still, we arrive at NGC-2392, the Eskimo Nebula. The Eskimo is just SE of the star 63 Geminorum. In my 8" Coultter and a 12mm eyepiece, it looks fuzzy, blue green, out of focus star. In a 7.4mm eyepiece the edges of the nebula appeared fuzzy and the center was bright. The actual separation between the outer nebulosity and the core was not visible. This fuzzy ring around the nebula rise to the appearance of a parka hood around an Eskimo face. In the 14 from Windham N.Y., I've seen the hood of the Eskimo. At any rate, this 8TH magnitude nebula will provide a great view in any scope. Farther east still we run into NGC-2420. This is a fine cluster of about 9TH magnitude containing about 30 stars. Cutting north underneath Castor and Pollux is another dim planetary, NGC-2371 & 72. This is actually one nebula with a figure 8 shape that gives it the appearance of two nebulae. It is around 12th magnitude, like J-900, however it is larger and, therefore, is easier to see. Swinging back west again almost to our starting point, we reach the last object in our tour of Gemini, NGC-2266. Here we have another open star cluster, as would be expected near the Milky Way. NGC-2266 is about 9TH magnitude and about as large as NGC-2158 although nowhere near as rich. It is still a good cluster with a fairly rich core. The cluster contains about 30+ stars.

These are by no means all of the objects in Gemini. There are many galaxies and radio sources listed in the Uranometria 2000 star atlas, but most of these are probably too dim to see.

Happy Hunting,

Glenn



Gemini and a few of its neighbors.



Looking Ahead...

This month's business meeting will be held on March 8, 1989. All members are urged to attend. As always the business meeting is open to the public, so, bring a friend. After the meeting Glenn Burke will conclude his "tracker" workshop which began after the February business meeting.

There will be four Regular Meeting/Observing Sessions this month. They are on March 1, 15, 22 and 29 and will be held at the Rifle Camp Park observatory at 8:00pm.

There is one public night scheduled this month. It will be held on March 31, 1989. This will be the second of the "Special" public nights being held this year. It will be dedicated to viewing the planet Jupiter. All members are urged to participate.

There are no regular public nights scheduled this month.

A member who requested to remain anonymous has donated a 1200 baud

modem for the club's computer. All that is now necessary is software and we can make the proper arrangements for starting the club bulletin board system. Anyone knowing of a good deal on BBS software, for our IBM computer, contact Mike Koenig, our Computer Chairperson.

The club will be holding its second annual Messier Marathon on Saturday, March 11, 1989 at the West Milford dark sky site. Anyone participating in this event is strongly advised to come early, or you may miss the earlier objects. Any member who needs directions to the site can get them from most any other member.

The club often observes on clear Saturday and Friday nights, check with the club answering machine to find out if any other members will be going. Also, any member can use the West Milford site whether or not other members will be present. Check with Glenn Burke or Dennis Koenig for instructions on getting permission.

Anyone interested in attending the Stellafane Amateur Telescope Makers' Convention in Springfield Vermont on August 4, 5 and 6 should see Glenn Burke. Also a side trip to either the Adirondack Mountains or Maine is being considered immediately following the convention.



FOR SALE

COULTER Odyssey 8", Mint Condition, Telrad finder, 28mm RKE eyepiece, \$250 call Joe Koenig at 340-3020

80 to 200 f4.5 Macro Zoom Lens, Pentax K mount, Like New, \$75 call Mike Koenig at 478-7699

Farewell

The N.J.A.G. bids farewell to dedicated and respected member, Mike Lynch. Mike and his family will be moving to darker and clearer skies in Austin, Texas. We would like to wish him the best of everything in his new endeavor and thank him for all he's done for the club as computer chairman. Good Luck and Keep In Touch. We'll Miss Ya!!

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Correctoins

A few members found the request for articles in the February DSO a little confusing. Articles submitted to the newsletter need not be written on a computer word processor. A (neatly) handwritten article will do just fine.

Dues for members who joined the club prior to February 31, 1988 were due by the February business meeting. not March 31, 1989.

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Canis Major

by Robert Frost

The Great Overdog,
That Heavenly beast
With a star in one eye,
Gives a leap in the East.
He dances upright
all the way to the West,
And never once drops
On his forefeet to rest.
I'm a poor Underdog;
But tonight I will bark,
With the Great Overdog
That romps through the dark.

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Dates

Mar. 7 New Moon

Mar. 8 N*J*A*G Meeting

Mar. 14 First Quarter Moon

Mar. 22 Full Moon

Mar. 30 Last Quarter Moon

Mar. 31 Public Night

The Dark Sky Observer is a publication of the North Jersey Astronomical Group. All members are invited to write articles for the newsletter.

Anyone interested in writing an article please contact the editor at a meeting or through the mail:

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Public Nights 1989

February 24	8:00 til 10:00	SPECIAL NIGHT - THE WINTER SKIES
March 31	8:00 til 10:00	SPECIAL NIGHT -JUPITER
April 14	8:00 til 10:00	JUPITER MARS MOON ORION NEBULA
April 21	8:00 til 10:00	" " " BEEHIVE CLUSTER
May 5	8:00 til 10:00	SPECIAL NIGHT - MARS
May 12	8:30 til 10:00	JUP. MARS MOON VENUS M-13-CLUST.
May 19	8:30 til 10:00	" " " " GAL. M-65+66
June 3	1:00 til 10:00	SPECIAL EVENT - ASTRONOMY DAY
June 9	8:30 til 10:00	VENUS MARS MOON GALAXY M-81+82
June 16	8:30 til 10:00	" " " M-13 CLUSTER
July 8	1:00 til 10:00	SPECIAL EVENT - SUN+STARS
July 14	8:30 til 10:00	VENUS SATURN MOON RING NEBULA
August 16	8:00 til 10:00 **	SPECIAL EVENT -LUNAR ECLIPSE
September 1	8:00 til 10:00	SPECIAL NIGHT -SATURN
September 8	8:00 til 10:00	SATURN MOON DUMBELL NEBULA
September 15	8:00 til 10:00	SATURN MOON ALBIREO M-11CLUSTER
October 7	8:00 til 10:00	SPECIAL NIGHT -THE MOON
October 13	8:00 til 10:00	SAT. MOON DBL. CLUST. ANDROMEDA
November 3	8:00 til 10:00	SPECIAL NIGHT -DEEP SKY OBJECTS

ALL EVENTS CANCELLED IN CASE OF INCLEMENT WEATHER EXCEPT DAYTIME ACTIVITIES ON ASTRONOMY DAY.

** ARRIVE EARLY FOR BEST VIEW OF ECLIPSE.